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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/996,318	11/23/2001	Sadahiko Kondo	60303.5	2573

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EXAMINER

OJINI, EZIAMARA ANTHONY

ART UNIT PAPER NUMBER

3723

DATE MAILED: 12/22/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/996,318

Applicant(s)

KONDO ET AL.

Examiner

Anthony Ojini

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 29-37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 November 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☒ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Applicant's election without traverse of Group 1, claims 1-28, in Paper No. 7 is acknowledged. However, claims 29-37 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Election was made **without** traverse in Paper No. 7.

Drawings

Figure 7 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 13, line 2, the expression "curtain-like flows of a gas or the coolant" is unclear which element applicant is referring to.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 7-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okuno et al. (5,827,113) in view of Chikuba et al (6,381,830) and Huber et al. (6,390,896).

With respect to claim 1, Okuno et al. disclose a method for cutting a work piece (50) using a wire (6), comprising the step of:

cutting the work piece with the wire traveling in a state that a portion of the workpiece to be cut with the wire is immersed in a fluid coolant (60) as the main component.

Okuno et al. fail to disclose the workpiece is a rare earth alloy and also fails to disclose the coolant having a surface tension at 25⁰C in a range of 25 mN/m to 60 mN/m. Okuno et al. also fail to disclose the wire include abrasive grains fixed to a core wire.

Chikuba et al. disclose a workpiece that is an Nd-Fe-B rare earth sintered alloy.

Chikuba et al. also disclose the coolant having a surface tension at 25⁰C in a range of 92 to 175 mPa.sec., but fail to show the range of 25 mN/m to 60 mN/m.

Huber et al. disclose a cutting wire that includes abrasive grains fixed to a core wire.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide apparatus of Okuno et al. with rare earth alloy in view of

Chikuba et al. so as ensure a long-time continuous operation by preventing wire snapping and by drastically reducing the number of times the coolant is replaced.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide apparatus of Okuno et al. with cutting wire that include abrasive grains fixed to a core wire in view of Huber et al. so as cut the work piece more efficiently.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to the optimum range as claimed by the applicant, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

In re Aller, 105 USPQ 233.

With respect to claims 7,21,22, Okuno et al. fail to disclose a wire that include abrasive grains fixed via a epoxy resin layer formed on the outer circumference of the core wire.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide apparatus of Okuno et al. with a wire that include abrasive grains fixed via a resin layer formed on the outer circumference of the core wire, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416. See also *Ballas Liquidating Co. v. Allied industries of Kansas, Inc.* (DC Kans) 205 USPQ 331.

With respect to claims 8,9,23,25, Okuno et al. fail to disclose the optimum ranges as

claimed by the applicant.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to the optimum ranges as claimed by the applicant, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

In re Aller, 105 USPQ 233.

With respect to claim 10, Okuno et al. disclose wherein in the step of cutting, the portion of the workpiece to be cut with the wire is immersed in the coolant contained in a reservoir (18), and the coolant is supplied into the reservoir from the bottom of the reservoir and also from an opening of the reservoir, so that the coolant is kept overflowing from the opening (see fig. 5).

With respect to claim 11, Okuno et al. fail to disclose wherein the amount of overflow of the coolant per minute is 50% or more of the volume of the reservoir.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide apparatus of Okuno et al. with fluid coolant wherein the amount of overflow of the coolant per minute is 50% or more of the volume of the reservoir, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

With respect to claim 12, Okuno et al. fail to disclose wherein in the step of cutting, the amount of the coolant supplied from the opening is greater than the amount of the coolant supplied from the bottom.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify of Okuno et al. with coolant wherein the amount of the coolant supplied from the opening is greater than the amount of the coolant supplied from the bottom, since it has been held that the provision of adjustability, where needed, involves only routine skill in the art. *In re Stevens*, 101 USPQ 284 (CCPA 1954).

With respect to claim 13, Okuno et al. fail to disclose wherein in the step of cuffing, the coolant are formed above the sides of the opening of the reservoir crossing the wire travel direction, so that the coolant is suppressed from overflowing from the opening of the reservoir.

Huber et al. disclose an apparatus comprising a coolant formed above the sides of the opening of a reservoir crossing the wire travel direction, so that the coolant is suppressed from overflowing from the opening of the reservoir (see fig. 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide apparatus of Okuno et al. with a coolant formed above the sides of the opening of a reservoir crossing the wire travel direction in view of Huber et al. so that the coolant is suppressed from overflowing from the opening of the reservoir.

With respect to claims 14, 26, Okuno et al. disclose wherein the wire is driven by a roller (4), but fails to disclose the roller includes a polymer layer having a guide groove formed therein, the guide groove has a pair of slopes at least one of which has an angle of 50 degrees or more with respect to the surface of the roller, and the wire travels along a space between the pair of slopes.

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It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide apparatus of Okuno et al. with rollers that include a polymer layer having a guide groove formed therein, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416. See also *Ballas Liquidating Co. v. Allied industries of Kansas, Inc.* (DC Kans) 205 USPQ 331.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide apparatus of Okuno et al. with the optimum value as claimed by the applicant, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

With respect to claims 15, 27, Okuno et al. fail to disclose a workpiece that is R-Fe-B rare earth sintered alloy.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide apparatus of Okuno et al. with R-Fe-B rare earth sintered alloy, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416. See also *Ballas Liquidating Co. v. Allied industries of Kansas, Inc.* (DC Kans) 205 USPQ 331.

With respect to claims 16, 28, Okuno et al. fail to disclose a workpiece that is Nd-Fe-B rare earth sintered alloy.

Chikuba et al. disclose a workpiece that is an Nd-Fe-B rare earth sintered alloy.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide apparatus of Okuno et al. with rare earth alloy in view of Chikuba et al. so as ensure a long-time continuous operation by preventing wire snapping and by drastically reducing the number of times the coolant is replaced.

With respect to claim 17, Okuno et al. is disclosed in **claim 1** above except the steps of allowing the wire wound around a reel bobbin to travel between a plurality of rollers; and supplying a first coolant containing water as the main component to portions of the wire wound around the reel bobbin or portions of the wire traveling near the reel bobbin.

Huber et al. disclose a step of allowing the wire (3) wound around a reel bobbin (20) to travel between a plurality of rollers (13,14); supplying a first coolant (9) containing water as the main component to portions of the wire wound around the reel bobbin or portions of the wire traveling near the reel bobbin (see figs. 2a-2d).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide apparatus of Okuno et al. with step of allowing the wire wound around a reel bobbin to travel between a plurality of rollers in view of Huber et al. so as to ensure the sawing wire does not become crossed

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide apparatus of Okuno et al. with step of supplying a coolant containing water as the main component to portions of the wire wound around the reel bobbin or portions of the wire traveling near the reel bobbin in view of Huber et al. so as to clean the wire and prevent entrapment of sludge such as abrasives silicon

into the winding area.

With respect to claims 18, 19, Okuno et al. fail to disclose wherein a first coolant has a coefficient of dynamic friction against the rare earth alloy at 25⁰C of 0.3 or less; and a second coolant has a coefficient of dynamic friction against the rare earth alloy at 25⁰C of 0.1 to 0.3.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide apparatus of Okuno et al. with the optimum value as claimed by the applicant, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

With respect to claim 20, Okuno et al. disclose wherein the coolant is supplied to the wire by spraying (see figs.1,5).

With respect to claim 24, Okuno et al. fail to disclose wherein the first coolant is higher in viscosity than the second coolant.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify of Okuno et al. with two fluid coolant wherein the first coolant is higher in viscosity than the second coolant, since it has been held that the provision of adjustability, where needed, involves only routine skill in the art. *In re Stevens*, 101 USPQ 284 (CCPA 1954).

Claims 2-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okuno et al. in view of Chikuba et al. and Huber et al. as applied to claim 1 above, and further in view of O'Neil (5,176,850).

With respect to claims 2-6, Okuno et al. fail to disclose coolant that contains the following elements: a water-soluble synthetic lubricant and water in a weight 10 times to 50 times as large as the weight of the synthetic lubricant; a surfactant and water in a weight 10 times to 50 times as large as the weight of the surfactant; an anti-foaming agent; a pH of 8 to 11; and an anti-corrosive.

O'Neil discloses a coolant comprising a water-soluble synthetic lubricant (col. 6, line 11 & col. 10, line 43- 46); a surfactant (col. 6, line 23); an anti-foaming agent (col. 6, line 26); a pH (col. 11, line 49); and an anti-corrosive (col. 6, line 21) except the optimum ranges as claimed by the applicant.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide apparatus of Okuno et al. with a coolant comprising a water-soluble synthetic lubricant, a surfactant, an anti-foaming agent, a pH, and an anti-corrosive in view of O'Neil so as to ensure the coolant is effective as a corrosion inhibitor.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to the optimum ranges as claimed by the applicant, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

In re Aller, 105 USPQ 233.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Raleigh discloses aqueous antifoam composition. Takeuchi, Hayashi et al., and Katamachi et al. disclose cutting wire apparatus respectively.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Ojini whose telephone number is 703 305 3768. The examiner can normally be reached on 7.30 to 5.00 Tuesday-Friday with every other Monday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Hail can be reached on 703 308 2687. The fax phone number for the organization where this application or proceeding is assigned is 703 308 3590.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 1148.

